DOCUMENT RESUME

ED 063 831 FL 003 232

AUTHOR Cazden, Courtney B.
TITLE Two Paradoxes in the Acquisition of Language Structure and Functions.
PUB DATE Jan 72
NOTE 29p.; Paper presented at a conference sponsored by the Developmental Sciences Trust, London, England, January 10-14, 1972

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Child Language; *Communication Skills; *Early Childhood; *Educational Environment; Educational Experiments; Environmental Influences; Group Instruction; *Language Development; Language Instruction; Language Programs; Language Research; Language Skills; Speech; *Teaching Methods

ABSTRACT

This paper considers language development among children and discusses the influence of the learning environment in the acquisition of language use as distinct from language structure. The results of the five studies reported here suggest that the child is aided by what he is encouraged to say, not simply by what he hears, and that adults seem to be essential for such encouragement. Language development proceeds most efficiently, both in functions as well as structure, when motivated by powerful communicative intent. The group instructional environment must be natural and less didactic; it should be possible to maximize familiarity in child-adult relationships and guarantee that the children who need talking time with adults get it. A bibliography is provided. (VM)

ED 063831

# TWO PARADOXES IN THE ACQUISITION OF LANGUAGE STRUCTURE AND FUNCTIONS*

Courtney B. Cazden

Harvard University

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Discussions of skilled performance usually include speaking as one example - along with other behaviors as diverse as spelling, playing chess, swimming, bicycling, and playing the piano (see Miller, Galanter & Pribram, 1960; and three philosophers: Polanyi, 1964; Ryle, 1949; Scheffler, 1965). Scheffler and Polanyi distinguish between two levels of skilled performance - levels in the sense of a set of nested hierarchies in which one level is a component of the next. Scheffler uses the terms "facilities" and "critical skills" to contrast them, and places speaking, or "grammatical talk" as he calls it, at the lower level:

> Grammatical talk, like observance of chess propriety, is an ingredient of intelligent performance. It is a bit of know-how nested within another, more complex, bit of know-how. Nonetheless, it is not itself of the same order, being removed from the sphere of critical judgement, which focuses on the whole (Scheffler, 1965, p. 100).

Polanyi discusses the same distinction as two kinds of awareness: subsidiary and focal. When hammering in a nail, the nail is the focal object of our attention, while the hammer is the subsidiary instrument of it:

> Subsidiary awareness and focal awareness are mutually exclusive. If a pianist shifts his attention from the piece he is playing to the observation of what he is doing with his fingers while playing it, he gets confused and may have to stop. This happens generally if we switch our focal attention to particulars of which we had previously been aware only in their subsidiary role. ... This scheme can be easily reformulated and expanded in terms of <u>meaning</u>. If we discredit the usefulness of a tool, its meaning as a tool is gone. All particulars become meaningless if we lose sight of the pattern which

---

*Paper presented at a conference on The development of competence in early childhood, sponsored by The Developmental Sciences Trust, CIBA Foundation, London, January 10-14, 1972. An earlier version of part of this paper was presented at the New England Psychological Association, New Haven, November 13, 1971. Some of the research reported herein was supported by a grant from the Ford Foundation to Courtney B. Cazden.

FL 003 232

they jointly constitute.

> The most pregnant carriers of meaning are of course the words of a language, and it is interesting to recall that when we use words in speech or writing we are aware of them only in a subsidiary manner. This fact is usually described as the transparency of language (Polanyi, 1964, pp. 56-57).

Everything we know about the language of adults and children justifies this distinction between "facility" and "critical skills." We can consider knowing how to speak and comprehend sentences as a facility, attended to only in a subsidiary way as it constitutes a part of some higher order unit of behavior which can be called a critical skill and to which we give our focal attention. The more familiar terms for these two aspects of speech are language structure and language functions respectively, but we don't always realize the difference in our level of attention to them.

It is intuitively obvious to us as adult language users that when either speaking or listening, our attention is focused not on sounds or words or syntactic patterns, but on the meaning and intention of what we or someone else is trying to say. It is less obvious that, with the exception of self-initiated play with sounds and practise of syntactic patterns (Weir, 1962), the same is true of the child language learner.

Descriptions of spontaneous mother-child interaction can be summarized: First, adults simplify their speech to young children. Snow (in press) shows that women, whether or not they are mothers, simplify their speech in particular ways, and Drach's analysis of the speech of a lower-class Black mother (Slobin, 1968) shows that such simplification is not confined to middle class adults. Martin Richards spoke at this conference about the special behavior of mothers toward their infants. There may be special characteristics, as yet unidentified, of the speech of mothers to their own babies, but rules for simplifying speech to children seem to be a part of general adult communicative competence. Second, parental responses are fitted to the child's speech in the form of expansions and extensions (see Cazden, in press, for one recent discussion). Third, there is no deliberate sequencing of what the child hears or is asked to say, and no correction or reinforcement of his maturing syntax (Brown, Cazden & Bellugi, 1969). Whatever environmental assistance the child gets, it is clear that he never gets sequential tuition based on any deliberate analysis of component skills.

Psychologists may, after the fact, conjecture about the inforamtion about language structure conveyed in parent utterances. Snow proposes specific benefits for some of the simplifications in parent-initiated statements. For example, partial repetitions like Put the red truck in the box now. The red truck, may provide information on the boundaries of grammatical units. Similarly with partial repetitions in new frames: Pick up the red one. Find the red one. Not the green one. I want the red one. And controversy over the effect of parental expansions continues.

Whatever the benefit to the child's language learning, the mother's attention is focused not on his learning of language structure but on her intended function of successfully guiding his actions. Bellugi's comments on the conversation of one mother-child pair fits all the families where spontaneous mother-child interaction has been studied (Brown, Cazden & Bellugi, 1969; Horner, 1968; Phillips, 1970; Slobin, 1968; Snow, in press):

> The mother and child are concerned with daily activities, not grammatical instruction. Adam breaks something, looks for a nail to repair it with, finally throws pencils and nails around the room He pulls his favorite animals in a tow wagon; fiddles with the television set; and tries to put together a puzzle. His mother is concerned primarily with modifying his behavior. She gives him information about the world around him and corrects facts. Neither of the two seems overtly concerned with the problems that we shall pursue so avidly: the acquisition of syntax (Bellugi, in press).

The first paradox: Structure vs. Functions

The first paradox is that while the attention of neither parent nor child is focused on language structure, that is what all children learn well. In Alice in Wonderland, the Duchess says at one point, "And the moral of all that is -- 'Take care of the sense, and the sounds will take care of themselves.'" A variant of the Duchess's moral also seems true: take care of the function and the structure will take care of itself. Of, in Polanyi's terms, even if our attention is focused on critical skills, the facilities take care of themselves -- in our own language and in the child's acquisition.

I am not claiming that no individual differences exist in the rate at which children learn the language structure of their home community. Differences do exist in the mean length of utterance of young children of

any given age. Figure 1 shows production differences for 18 children that presumably indicate differences in their rate of acquisition of underlying knowledge of language structure. Moreover, it can be argued that individual differences in language comprehension are even greater. For instance, in her study of the relationship between organizational features of residential day nurseries in England and children's scores on the Reynell Language Development Scale, Barbara Tizard found significant relationships with the comprehension subscale but not with the expression subscale (Tizard, et al., in press). Differences in language comprehension probably become critical in later reading comprehension. In speech, however, both the presence of redundancy and supplementary non-linguistic context and the absence of comprehension tests at critical points make it unlikely that differences in knowledge of language structure affect communication.

Consider the knowlege required for correct interpretation of such sentences as "Ask John what book to read," or "John asked Mary what to paint." To test Lenneberg's hypothesis that a critical period for language learning ends with the onset of adolescence, Kramer, Koff and Luria (in press) tested people before and after age 12 for their comprehension of these structures, previously studied in younger children by C. Chomsky (1969). Two years after the original experiment, they retested those subjects who had failed the first one to see if those from 8-12 years had learned more in the interim than those from 12-20 years. Lenneberg's hypothesis was not confirmed; there were subjects on both sides of Lenneberg's linguistic watershed who still had not learned how to interpret this construction correctly. Of more interest for the present discussion, Kramer et al found that the high school and college students who did not understand it in pure test situations seemed at no loss in normal conversation.

> We have wondered how an adult fares without competence in these exceptional structure and have attended to real-life situations with adults who lacked some syntactic structure. It seems to us that adult speakers have enough redundancy in their everyday speech to cover up lack of competence. They may respond incorrectly but they often continue talking, thus providing the answer to the question posed. Adults rarely correct other adults' linguistic errors. Thus, once the information requested is given, the form of the response is rarely remarked upon. Language is for communication; the redundant answer "corrects" the linguistic error (Kramer, Koff & Luria, in press).

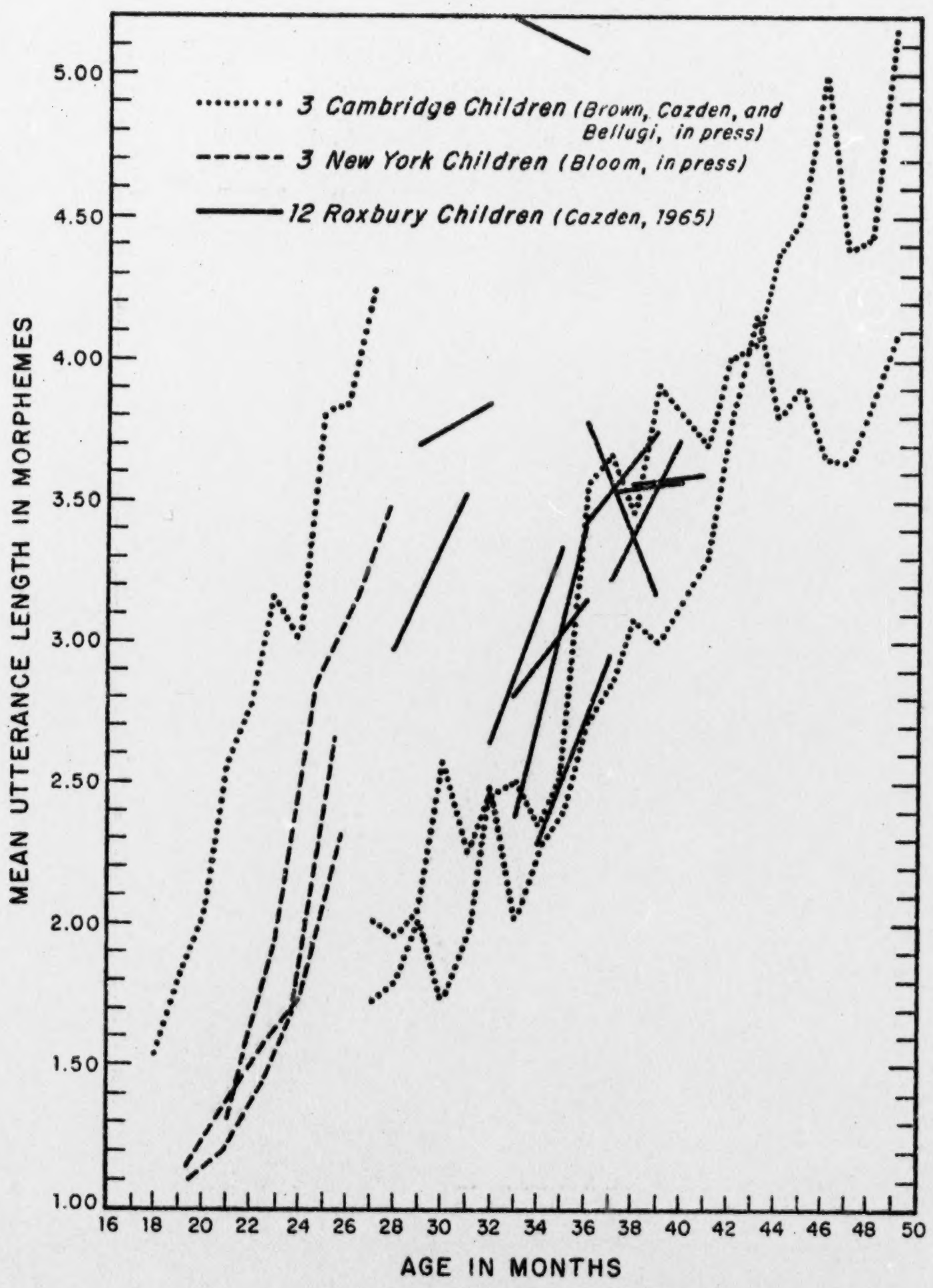


Fig. 1 – Mean Utterance Length and Age in 18 Children.

I have argued elsewhere (Cazden, 1970) that differences in language effectiveness among children are concentrated in aspects of language use rather than in the relative size of a child's structural repertoire. This is admitedly a controversial point. It has received additional theoretical arguments from Cole & Bruner (1971), and assent without additional evidence from Ervin-Tripp (1971) in her paper for the 1968 CIBA Study Group on language acquisition. Ervin-Tripp puts it this way:

> The evidence that we have suggests that the vast majority of linguistic rules are alike in the different varieties of English. But children might differ in the rate of mastery of shared rules. For such comparisons, test structures must use the dialect of the child's milieu, and [test] fundamental rules in the child's capacity, not his frequency of output which is subject to stylistic preference. ...The widespread belief that there are class and ethnic group differences in developmental rates, leading to "verbal deprivation" requires compensatory linguistic training, seems extremely ill-founded. We simply do not know whether there are reliable differences in the rate of development of basic linguistic skills, in the emergence of fundamental milestones such as the ability to understand or imitate multi-word sentences, subject versus object, and imbedded sentences. The little evidence we have suggest no differences (Ervin-Tripp, 1971, pp.31-32).

Two sets of observational data are now available in further support of that argument.

First, some observations of children's use of negatives. One of the goals of the Bereiter-Englemann (1966) preschool curriculum is to teach children to make negative statements such as That is not a pen. It seemed likely to me that children in any group of four-year-olds could use these negative structures in their spontaneous speech. Last year, a research assistant, Tina Schrager, spent many hours in a Head Start program which followed the Bereiter-Englemann curriculum, recording children's negative statements in all situations except the language lesson itself. She worked out a set of structural categories derived from Klima & Bellugi's (1966) longitudinal research; and she stayed on the job (for 14-16 hours in each of three groups) until she had examples of all but the negative indefinites from all the children, even those in their first term in this program. Figure 2 gives utterances in all four structural categories for three of these beginning (B) children (Schrager, 1971).

Figure 2 Negative Utterences from Three Children (From Schrager, 1971)

| | NEG-IMP | NEG-MV | NEG-AUX | NEG-INDEF |
|---|---|---|---|---|
| Darnell (9) | D Don't take all of it. | D My name ain't Gail.<br>D You don't know how. | D No, you can't do 3s.<br>D Why can't we pull this up?<br>D I can't either.<br>D You can't do like this. | N We don't have nothing to cut with.<br>R I don't want any cheese. |
| Laura (15) | D Not over here, over there. | D You don't have no badge on.<br>D I don't like green peppers.<br>D I don't like J.<br>D I don't like Mom.<br>D. That 8's not upside down. | D You can't do it.<br>D I can't do this<br>D We can't dig it 'cause snow's on the ground.<br>D I can't hear you.<br>D I can't see you.<br>D I'm not gonna do it on the back.<br>D I'm not gonna fall.<br>D That girl don't supposed to have no dress on a rainy day. | D I never seen green. |
| Aaron(36) | D Don't do that<br>D Don't mess up my thing.<br>D Don't mess up that.<br>D Don't take them.<br>D Don't put no little ones there.<br>D Don't bend it. | D No, this 3 is not lying down.<br>D This string is not straight.<br>D I didn't.<br>D We didn't talk about that, right?<br>D We don't eat it.<br>D I don't eat green peppers.<br>D No, we didn't.<br>D My mother don't cook that.<br>D I don't like green peas.<br>D We don't have them.<br>D Not me.<br>D He don't do his 8s right.<br>D Them are not 8s.<br>D That's not a 8.<br>D That's not a white triangle.<br>D You don't like it like this?<br>D No, I don't want to. | D Lester won't stop.<br>D You can't play.<br>D Paul won't stop. | D I never taste that.<br>D Don't put no little ones there. |

Negative statements can also be categorized according to semantic intentions rather than structural characteristics. In her longitudinal research, Bloom (1970) uses three categories, and suggests the following order of acquisition: non-existence (N), rejection (R), and denial (D). Of the three children in Figure 2, only Darnell used negative-utterances for rejection or denial while Schrager was listening. Overall, Schrager found that 360 out of 395 negatives from all three groups fit Bloom's definition of "denial:" in which "the negative utterance asserted that an actual (or supposed) predication was not the case" (Bloom, 1970, p.173). Denial is the semantic category emphasized in the Bereiter-Englemann curriculum.

In reporting observations that structurally, these children are capable of more complex utterances than are being requested in their lessons, I am not arguing that the Bereiter-Englemann curriculum is unnecessary or useless. The question remains as to what the children are learning about language use.

Second, Joan Tough, whose research at Leeds on the language of "favored" and "less favored" three-year-olds I have reported elsewhere (Cazden, 1971), now has data on seven-year-olds. While her analysis is not complete, she writes "it seems to me that in fact our less-favored children are capable of using a good deal of complexity of structure, but that its use is confined to a rather limited range of functions" (personal communication, 1971).

## Which language functions are of most worth?

If we are going to look for the developmental antecedents of effective language use, what should we focus on? Given the wide range of possible language functions, which are of most worth on some criteria? These questions become particularly important when we shift from describing development to planning the kind of deliberate environmental assistance that is called education. In a still unfinished paper, Kohlberg & Mayer suggest criteria for answering the question from the viewpoint of a "developmental philosophic strategy" that draws on both Piaget and Dewey. Following is a precis of a section of their paper, subtitled "Development as the aim of education:"

Development defines a behavioral change of educational worth. Development is not just any behavior change, it is change in the direction of greater differentiation, integration and adaptation. While theories of specific learning have assumed that information and habit are learned for extrinsic motives, cognitive-developmental theory assumes that the child's present stage is rejected and the next one sought as preferred because of its greater intrinsic adequacy.

The cognitive-developmental position claims that to call a behavior change "development" implies that it meets the following criteria:

1. The change is irreversible...

2. The change is general over a field of responses and situations.

3. The change is a change in shape, pattern, or quality of response, not merely in the frequency of its correctness according to an external criterion.

4. The change is sequential: it occurs in an invariant series of steps.

5. The change is hierarchical, that is, the later forms of response dominate or integrate the earlier forms.

A specific area of behavior change like "fundamental arithmetic reasoning" may meet these criteria or it may not. Englemann claimed to have artificially taught children the "naturally developing" operation of conservation, but Kamii found that the children so taught met Englemann's criteria of conservation without meeting the criteria of development, e.g. the response could be later forgotton or unlearned, it was not generalized, etc. We have given an example in which a set of responses taught artificially do not meet the developmental criteria met by "natural development." This is not because an educational intervention is incompatible with developmental change, but it is because the intervention was found to mimic development rather than to stimulate it.

To call development natural is to call it universal, not to call it either independent of experience or inevitable... It is the universality of sequences of development which warrants them as educational goals.

It seems obvious that many changes or learnings are of value which are not universals in development. As an example, the capacity and motivation to read does not define a universal of development, yet it seems to be a basic educational objective. According to Dewey, the worth of any special form of learning must be jedged in terms of its impact on and relevance to universal and general development. It seems plausible that increased capacity to read, though not itself a development, can contribute to cognitive social and aesthetic development. (Quoted in abbreviated form from Lawrence Kohlberg and Rochelle Mayer, unfinished ms., 1971.)

What changes in language would be considered developmental change according to Kohlberg and Mayer's criteria? In language structure the

answer is clear because the sequence of development has been discribed in some detail in recent research. At least this is true for the first 4-5 years. Beyond that age, the picture is inevitably more fragmented because of the complexity of the whole syntactic system. But how do we think about language use in these terms?

Potentially, Kohlberg & Mayer's criteria provide a basis for evaluating the assertions that language functions highly developed in particular subcultural groups should be incorporated into the school curriculum. It does not devalue the importance of particular verbal skills in a group's cultural life to suggest that the education should focus on aspects of language use. which cut across particular functions and show developmental change in all children. In saying this, I accept Cole & Bruner's admonition that the context and content for such education should vary from culture to culture, and that "relevant materials are those to which the child already applies skills the teacher seeks to have applied to his own content" (Cole & Bruner, 1971, pp 874-875).

Three aspects of language use seem candidates for goals of education: First, coding ability, the term used by Brown (1966) for the ability to free language from dependence on its nonlinguistic context and communicate ideas through words along. Second, metalinguistic awareness that makes it possible to focus on language as an object of attention as well as use it as a medium of communication (Elkonin, 1971). Third, the use of language in some form of inner speech that leads during the 5-7 period to an ability to internalize directions given by another and stay with an imposed task, in tests or real life, without visual or verbal support and reinforcement from another person. All three aspects of language use meet Kohlberg & Mayer's secondary criterion of being instrumental to other aspects of development, and may also meet their primary criteria as well.

In this paper I will discuss only coding ability, or the decontextualization of speech as it is sometimes called.* Because discussions of context-dependent versus context-free speech often center around the writings of Basil Bernstein, it is important to confront the controversies over his work. Discussing one of Bernstein's more recent articles (Bernstein, in press),

*Just as"decontextualization" refers to the use of symbols outside of and subsequent to their use in contexts of concrete reference, so we might adopt the term "precontextualization" for playful practise with symbols outside of and prior to such use. An example of precontextualization would be the Anthony Weir's practise with sounds and syntactic patterns during his presleep monologues. (Weir, 1962)

Hymes (in press) takes this position:

> Bernstein is of course noted for his concepts of <u>restricted</u> and <u>elaborated</u> codes. ... In this paper the essential difference between 'restricted' and 'elaborated' codes is taken as the predominant use of particularistic, relatively context-specific, meanings in the former, and of universalistic, relatively context-free, meanings in the latter.
>
> It would be easy to conclude that the 'elaborated' code with its universalistic meanings is simply superior to the 'restricted' code which many of the children whom Bernstein has studied bring to school , and that the task of the school is to replace the one by the other. This conclusion would distort Bernstein's meaning. Context-dependent meanings are essential to many kinds of communication that make social life, a meaningful personal life, possible. All of us seek out people we can 'talk to', with whom much can be taken for granted. It is in the nature of man to need symbolic interaction of this kind. One of the great dangers of modern society is the rapid encroachment of technocratic-bureaucratic modes of communication upon spheres formerly reserved for symbolic communication of the particularistic kind. A life in which all meanings had to be made explicit by the norms of some external rationality, where there was no one to whom one could say, "you know what I mean," would be intolerable.
>
> Bernstein is in the complex, difficult position of both defending the value of the kind of communication he calls a 'restricted code' and of insisting on its limitations. His position will please few. Those who defend children by placing all blame on the schools, and those who explain the failures of schools by blaming the language of the children, will be both offended. For Bernstein maintains that one must respect, understand and maintain the culture of the child, including its 'restricted code,' but that one must also give the child the essential elements of the 'elaborated code' with its universalistic meanings. He maintains that the latter is not 'compensatory education,' it is education pure and simple.
>
> Let me repeat. Bernstein is not talking about social acceptability-about negative concord, pronunciation, or other traits of language varieties, and he is not saying that some children lack language or cognitive skills. In demanding that all children have access to the universalistic meanings of the 'elaborated code' he is arguing for a revolution in relationships of power. For in his conception it is the 'elaborated code' which contains an

> elaboration of means for 'talking about talk,' a meta-language, in other words, for objectifying and analyzing the forms, school, and society at large. Bernstein is saying that the purpose of teaching this mode of language use is not to preserve existing forms of social control and inequality (as it appears to many who see the schools as instruments of repression), but to aid those who are unequal to analyze and transform their situations (Hymes, in press).

I agree,
and in the remaining two sections, I will describe experimental attempts to increase children's coding ability, and then discuss the second paradox: language acquisition versus language education.

## Coding Ability

Differences in coding ability have been found in both observations of what children say in spontaneous speech and what they can say on tests, and among both age and social class groups:

| | differences in spontaneous speech | difference on tests |
|---|---|---|
| differences among ages | Piaget (1926)<br>Flavell et al (1968) | Krauss & Glucksberg (1969) |
| differences among social class groups | Tough (Cazden, 1971) | Heider (1971) |

These differences cannot, therefore, be passed off either as an artifact of an unnatural test situation to which some children adjust more easily, nor as merely a disposition or preference in ordinary conversational situations where minimal explicitness is in fact adequate.

Five attempts to teach coding ability illuminate how knowledge of language use may depend on different kinds of environmental assistance then knowledge of language structure. The five attempts are by Donald Moore (1971), Smothergill et al (1971), Luria & Yudovich (1959), Vera John (1968) and Jean Berko Gleason (1971).

Moore (1971) designed, conducted and compared two preschool language programs aimed at fostering explicit language use in talking about selected materials and pictures. On specific days, syntactic patterns, vocabulary

and concepts such as the following were the focus of attention:

> use of the copula: This dog is black.
> expression of part-whole relationships: The dog has a tail.
> expression of spatial relations: The dog is behind the cage.
> categorization: This is an animal.
> use of compound subjects: The boy and girl are running.
>
> (Moore, 1971, Appendix B)

The two programs shared the language curriculum, but differed in mode of adult-child interaction. In what Moore called the "patterning" treatment, the adult tried to elicit descriptions from the child and even asked the child to repeat her more adequate model; in his terms, the child's language was contingent on the adult's. In what Moore called the "extension" treatment, the adult's language was contingent on the child's; she responded to the child and, in so doing, modeled for the child the particular aspect of language which was the focus of attention in both programs that day. There was also a third "control" group in which adult and child talked with no particular linguistic intentions embodied in the adult utterances.

Thirty-six 4-year-old Black children were randomly assigned to these three groups. Three adult tutors talked with them in pairs, two pairs per adult from each of the three groups, during a three-hour pre-school held in two adjacent apartments in the large low-income project in which all the children lived. Moore used a set of tests which included a sentence-imitation test, (a kind of test widely assumed to test syntactic maturity), the WIPPSI, and a version of the two-person communication game.

For the communication game, arrays of abstract designs previously used by Krauss and others (e.g. Krauss & Rotter, 1968), and more realistic pictures of children (designed by Arthur McCaffrey in another research project at Harvard) were presented, and each child was asked to describe a target picture so that his partner could pick out the same picture from his differently arranged array. Moore scored the children's verbal descriptions for both complexity and accuracy. Complexity included the length of the noun phrase: ball vs. the big, round ball. Accuracy can be scored in several ways. If the arrays of pictures are selected to separate criterial from

noncriterial attributes, one can objectively determine whether the descriptions include all criterial attributes. Moore's arrays were too complex to make this determination possible. A second method is to invoke the functional criterion of whether the listening child guesses correctly. But then the listener's ability to process information contaminates the analysis. Moore used a third technique adapted from Krauss. Random subsets of all the children's pre- and post-test descriptions were presented, with the full array of pictures, to a group of adults in the child's home community -- adults in the local Community Action Program (CAP) office, etc. These adults were asked to guess which picture the child was describing. From these answers, one can work back to a communication accuracy score for each child.

Moore found no treatment effects on the sentence imitation test scores after correction for dialect differences, despite the fact that the patterning treatment included practice in imitating adult utterances. To return to an earlier argument, this finding, together with the finding that on a factor analysis of pretest scores the imitation test came out as a separate factor all by itself, provides further evidence that syntactic development is a separable aspect of communicative development, and an aspect not only relatively less vulnerable to naturally recurring environmental differences but also less amenable to deliberate environmental intervention. The patterning treatment was more effective in raising scores on the WPPSI, especially for the children who started with an initial WPPSI IQ score below 85. It was also more effective in improving the complexity and accuracy of the children's descriptions on the realistic pictures.

An important part of Moore's research was his investigation of the relationship between a child's gains from pretest to posttest and characteristics of the interaction between that child and his tutor during the treatment sessions. Midway through the three-month treatment, Moore recorded two 7-minute segments of these sessions for each child and analysed them for the length and complexity of adult and child utterances. Table 1 gives this data on two measures: mean length of all utterances, and number of noun phrases which include nouns and therefore are "expandable" because nouns, unlike pronouns, can be modified. In general teachers modeled more complex language in the extension treatment whereas children used more complex language in the patterning treatment.

Moore then did a stepwise regression

analysis to answer two questions: Starting with a set of pretest scores for each child, how much is added to a prediction of that child's posttest scores by information on how his tutor talked to him during treatment? Then, how much additional predictive power is added by information on how the child himself talked during treatment. For the imitation test, neither added a significant increment. For the WPPSI, predictions were so high from pretest alone that neither teacher nor child speech data made any difference. But for the accuracy and complexity scores on the communication task, information on the tutor's language added nothing, while information on child language added significantly to the prediction of posttest scores. That is, across all treatments, on these particular verbal performance skills of explicit description, children learned what they had themselves practised, not what they had only heard.

TABLE 1

Language Measures from Recorded Treatment Sessions

(from Moore, 1971)

| TEACHER LANGUAGE Mean Length of Utterance | | CHILD LANGUAGE Mean Length of Utterance | |
|---|---|---|---|
| Patterning | 5.02 | Patterning | 4.36 |
| Extension | 5.18 | Extension | 3.48 |
| Activity | 4.84 | Activity | 3.11 |
| Average | 5.01 | Average | 3.65 |
| **Total Expandable Noun Phrases** | | **Total Expandable Noun Phrases** | |
| Patterning | 101.4 | Patterning | 39.00 |
| Extension | 140.0 | Extension | 25.91 |
| Activity | 35.1 | Activity | 8.18 |
| Average | 92.1 | Average | 24.36 |

Smothergill et al (1971) compared the effect of two kinds of teacher talk on the speech and problem solving of 24 white nursery school children, all of whose mothers were on welfare. For 17 days, each child was in a 20-minute small group session of six children and one teacher. With 12 of the children, teachers used an "elaborative" style -- both elaborating their own language beyond the minimum and deliberately eliciting verbal feedback from the children; with the other 12 children, the teachers maintained an equally warm but non-elaborative style of interaction. As in Moore's research, the treatment sessions were monitored to make sure that the treatments did in fact differ in the desired ways and to obtain records of child speech during the sessions. An analysis of variance of child verbalizations showed that children in the elaboratively taught group (E) did show a greater frequency of elaborated statements which conveyed more than the minimum information required for a task.

Furthermore:

> As might be expected, the verbalizations of Group E were significantly more often teacher-elicited than was true for Group NE ($p < .01$). This finding indicates that children in this group probably were responsive to their teachers' attempts to elicit comments from them. In fact, inspection of the interaction effects indicates that teacher-elicitation is specifically responsible for the greater frequency of elaborative statements of Group E subjects since a markedly greater number of teacher-elicited elaborations characterized this group compared with Group NE ($p < .01$), while the number of spontaneous elaborations of the two groups was essentially identical (Smothergill et al, 1971, p. 1235).

The hypothesis that the elaboratively taught group would produce more alternative solutions to problems was not confirmed.

Luria & Yudovich (1959) recount the story of a pair of twins who were retarded in speech development primarily because of the "twin situation which did not create an objective necessity for the development of speech as a special means of communication" (p.55). The two children were finally placed in separate Kindergarten groups, and the weaker twin, Yura, was given supplementary "special speech training:"

> The lessons were as follows. The child was first encouraged to give answers to questions, then required actively to name objects, and finally actively to answer questions, to repeat complete phrases and to describe pictures. The instruction continued for three months, then there was a break of two months; afterwards instruction was renewed and continued for a further six months (1959, p. 56).

Table 2* gives a comparative analysis for the functions of speech before separation and after three and ten months of treatment for Yura (A) and Liosha (B). For both twins, synpraxic speech tied to direct action decreased, and planning and narrative speech increased. The biggest difference between the two children, presumably due to the speech training, was in "speech transcending the bounds of a situation." After 10 minths, this constituted 52% of Yura's speech, but only 27.7% of Liosha's speech. From an all-too-rare combination of behavioral observations and tests, Luria and Yudovich conclude that both twins gained a great deal from the creation of an objective necessity for speech, but that in addition, Yura's special training produced greater initiative in verbal formulations of play projects, in comprehension of speech in test situations, and in what they call a "theoretical attitude" toward speech (that I called metalinguistic awareness above) which enabled Yura to reflect on words in sentences and perform operations on them such as counting. (See next page for Table 2)

Vera John's (1968) comparison of two treatments which she calls "verbal mediation training" and "story telling" is informative for what she did not find. The two treatments shared the same topics of conversation such as the concepts of same and different, growth, liquids and solids. In the Verbal Mediation Training, the teacher played a directive and questioning role in eliciting from the children labels for attributes and functions, categorizations of the materials, and predictions of what would happen after certain actions were performed. In the Story Telling treatment, the same concepts were discussed as carefully selected stories were read in an atmosphere of child listening and talking similar to bedtime story reading at home. 15-minute treatment sessions were conducted individually and daily with each child for five weeks in several Head Start centers.

---

*See page 16 for Table 2

TABLE 2

Comparative analysis of the functions of speech
before and after separation
(from Luria & Yudovich, 1959, p. 63)

| FORMS OF SPEECH | BEFORE SEPARATION | | AFTER 10 MONTHS SEPARATION | |
|---|---|---|---|---|
| | A | B | A | B |
| Number of sentences recorded | 69 | 69 | 45 | 58 |
| | % | % | % | % |
| 1. Synpraxic speech (connected with direct action) | 92.8 | 94.1 | 33.2 | 25.8 |
| 2. Planning speech | 4.4 | 4.3 | 45.9 | 46.5 |
| (a) within the bounds of a situation | 4.4 | 4.3 | 10.5 | 24.1 |
| (b) anticipatory | 0 | 0 | 35.4 | 22.4 |
| 3. Narrative speech | 2.8 | 1.6 | 20.9 | 27.7 |
| (a) connected with a situation | 0 | 0 | 4.3 | 22.4 |
| (b) not connected with a situation | 2.8 | 1.6 | 16.6 | 5.3 |
| Speech transcenting the bounds of a situation (2b; 3b) | 2.8 | 1.6 | 52.0 | 27.7 |

John predicted differential affects from the two treatments and got most of what she predicted, but not all. She used three tests: a concept sorting task, the Peabody Picture Vocabulary Test, and a story retelling task. As predicted, children in the Verbal Mediation Training improved significantly on the concept sorting task but not on the Peabody Picture Vocabulary Test, whereas for children in the Story Telling treatment, the reverse was true (John, 1968). But of greatest interest for the present discussion was the one surprise:

> The surprising finding was that the story telling intervention did not produce significant gains in story-

> retelling skills among these children. Some small gains were made, but they did not correspond in any way to the more dramatic results of the Verbal Mediation method of intervention.
>
> Intervention appears to establish a highly specific link between performance during training and similar skills elicited on post-testing. Though motivationally children may show great involvement - Story Telling was an enormously popular time in these Headstart centers - gains are less likely when the method of post-testing is indirectly related to intervention. Though children were encouraged to tell stories, the pressure was low, and they were not asked to produce lengthy, well-connected stories. We assumed that the learning, while indirect, would show up on post-testing. It did not! (John, personal communication, 1971).

Jean Gleason (1971) conducted a small-scale communication training in a nursery school, mixed in race and social class, which we shall call the Main Street School. In a two-child communication game, the children were asked to give descriptions of one of an array of pictures that had an M&M under it. Descriptions varied through the following scale:

> Pointing only.
> Pointing plus <u>It's under there</u>.
> Pronouns with exophoric reference: <u>She's putting them under there</u>.
> Effective communication: <u>The M&M is under a picture of a lady who's saying goodnight to her children</u>.

After the pretests, Gleason trained half of the better communicators and half of the poorer communicators in 15-minute sessions once a week for four weeks.

> The training was really more of the same game, except that each child who was being trained played with me instead of with another child, and I made every effort to provide a good model for him when it was my turn, and to ask questions of him when it was his turn, and generally steer him toward the kind of lanauge we wanted (1971, p.5).

Even in this short time, the trained children showed markedly greater improvement than the untrained children. When asked in the posttest to describe a picture they had never seen before, "All but one of the 8 trained children were in the highest, least egocentric category in their ratings. Only one control child gave a description of this type" (p. 8).

Gleason comments:

> I cannot believe that in one hour of training, spread out over a period of weeks, we actually taught these children any new language. Instead, what we must have done was to indicate to them which, of a variety of descriptive styles they had the potential of producing, was the one we wanted them to use, and our training sessions facilitated their use of that style. The fact that they were able to learn our style so easily indicates that elaborated code can be acquired by young children, regardless of their background (p. 10).

While the children were trained with an adult, they were posttested in child-child pairs, and Gleason (personal communication, 1971) believes there was some regression from the highest quality descriptions the children had given with her. In other words, their learning may have been too situationally specific: namely, that certain kinds of statements are valued by a particular adult.

What can we conclude from these five studies about environmental assistance to the use of language we call coding ability? First, in the acquisition of language use as distinct from language structure, the child is aided by what he is encouraged to say, not what he simply hears (Moore; Smothergill et al; John). Second, adults seem to be essential for such encouragement (Luria & Yudovich). Finally, there is a danger that specifid training will produce too specific learning (John; Gleason), and we need more concurrent behavioral observations (Luria & Yudovich) in order to track the generality of what children learn. Only then will we know if any such training meets Kohlberg & Mayer's criteria.

## Second Paradox:
## Language acquisition vs. language education

Let us assume that the children in the above 5 studies did make some short term gains in coding ability. What I am calling the paradox of language acquisition versus language education has two versions: one general, one more specific. The general version can be stated very simply: whereas all children learn their native language with seeming ease and despite wide

variations in environmental conditions, attempts at any kind of deliberate language education are rarely very successful, particularly if long-term effects are examined. The more specific version takes longer to describe; it contrasts descriptions of effective home environments for spontaneous language acquisition and descriptions of effective language education programs which achieve short-term effects at least.

As part of his long-term research project on the development of educability, Burton White is making observations in the homes of one- and two-year-old children across the social class range whose older siblings have attained either a notably high or a notably low level of social and intellectual competence. On the basis of incomplete analyses of these observational data, White comments:

> Our most effective mothers do not devote the bulk of their day to rearing their children. ... What they seem to do, often without knowing exactly why, is to perform excellently the functions of designer and consultant. By that I mean they design a physical world, mainly in the home, that is beautifully suited to nurturing the burgeoning curiosity of the one- to three-year-old. ...
>
> In addition to being largely responsible for the type of environment the child has, this mother sets up guides for her child's behavior that seem to play a very important role in these processes. She is generally permissive and indulgent. The child is encouraged in the vast majority of his explorations. When the child confronts an interesting or difficult situation, he often turns to his mother for help. Though usually working on some chore, she is generally within earshot. He then goes to her and usually, but not always, is responded to by his mother with help or shared enthusiasm plus, occasionally, an interesting, naturally related idea. These 10 to 30 second interchanges are usually oriented around the child's interest of the moment rather than toward some need or interest of the mother. ...
>
> These mothers very rarely spend 5, 10 or 20 minutes teaching their one- or two-year-olds, but they get an enormous amount of teaching in "on the fly," and usually at the child's instigation. Though they do volunteer comments opportunistically they mostly act in response to overtures by the child (1971, p. 87; emphasis in the original).

In White's research, verbal interaction is just one aspect of the child's life being studied. But his description fits the more focused analysis of mother-child speech done by Brown and his colleagues (Brown, Cazden & Bellugi, 1969). Here too, the responsive but generally non-didactic adult role is highly effective.

A paradox arises when that responsive role is translated into deliberate educational practise. The teaching role of designer and consultant closest to White's description takes place in the best traditional nursery schools, or in "open education" schools which take English Infant Schools as their model. Yet comparisons of the impact of idfferent kinds of preschool programs indicate that the more didactic programs -- seemingly farthest from White's mothers -- are more effective.(See Bissell, in press, for a general discussion compatible with the comparison of techniques for teaching coding abilities above.)

In short, we seem to be in a bind. On the one hand, the more didactic educational treatments which do bring about short-term gains may produce such limited behavioral change that, in Kohlberg & Mayer's terms, development is mimicked rather than stimulated. On the other hand, those group environments which seem to be most like homes that are good for language development have not been proven effective even in the short run. Part of the lack of proven effect may be due to insensitive measures. But we should not rely completely on the excuse of poor measures to resolve the paradox.

Consider three aspects of group environments which do not exist at home and which therefore require special planning by teachers. First, teachers are inevitably less familiar with individual children than mothers are. Mothers may be superb interlocutors for their young children just because they know the child and his world so well. When children in their second year of life can utter only a few meaningful words, a mother is most likely to understand the child's idiosyncratic pronunciation and be able to make a meaningful response. If the child says, "Baa," his mother can respond, "Your blanket? It's in the kitchen. On your chair," whereas no one outside the family would understand. Later when the child's speech more closely approximates normal pronunciation and is therefore intelligible to

a wider audience, idiosyncracies will remain in his lexicon, and the child will speak egocentrically in the sense of assuming that his listener knows the referents for his words. When a boy not yet 3 told his father, "Betty and I played radio last night," his father understood that Betty Bryant, a graduate student, had been there with her tape recorder; but only the child's mother knew that Betty had actually come earlier that day rather than the pervious night, and so only she could correct the child's encoding of past time. Someone outside the family could have said little more than, "Oh, that's nice" while wondering what had been going on.

In preschools, children will be speaking to adults (or peers) who are less unfamiliar with his pronunciation, his lexicon, and his world. In day care centers, the problem is magnified because more of the children will be under three years, each child will encounter a larger set of adults each week (changing shifts of staff, different volunteers each day, etc.), and the group environment will account for more of his speaking day. Under these conditions, unless teachers talk frequently with parents and visit children at home, meaningful conversation will necessarily be more limited to the momentary here and now of life in school. Structured language lessons are often limited in just this way -- but then the child gets little help in clarifying concepts and their verbal formulations outside this limited world. Furthermore, new communication skills practised at school will be less likely to generalize to the child's non-school world if topics of conversation in the two settings rarely overlap. Consistency in adult-child relationships may be as important for language as for affective development during the early years, even though an opposite case can be made for the beneficial challenge to older children of communicating with strangers.

Second, one aspect of any group setting, in contrast to the one-to-one relationship that prevails for at least part of most children's home day, is that teachers must distribute their attention and their conversational initatives among a group of children. In addition to the simple matter of a division of talking time, there is the more complex matter of an unequal division. A group environment can be 24 different environments for 24 children. Because teachers themselves respond to reinforcement, they may talk more to the children who talk most to them. Last year a student at Harvard, Anne Monaghan, provided empirical support for this hypothesis in

the Main Street School where Gleason had worked the year before. Ignoring the heterogenious age, race and social class of the children, Monaghan coded interactions according to who initiated the conversation and then computed the rank-order correlation between the list of children ranked according to number of verbal contacts they initiated with any teacher and the list of the same children ranked according to the number of verbal contacts any teacher initiated with them. The correlation was significant at the .05 level in the fall and at the .001 level in the spring. In Monaghan's words, over the course of the year

> the teaching staff appears to be reinforcing and amplyfying what already exists when children enter -- those children who initiate a great deal get teacher initiations in return while those who initiate infrequently are not frequently sought out by teachers. By ommission or commission, the general configuration of social abilities or deficits which a child brings with him to school will be strengthened as classroom policy now stands (1971, p. 16).

Monaghan's findings fit the only comparable research I know of, Talbert's (1968) study of a Black Kindergarten. Talbert found that those children, mostly boys, who started out on the periphery of teacher attention and teacher-led activities became more isolated as the year went on. One positive factor explaining the effect of the more didactic programs may be simply that they guarantee a more equal distribution of teacher attention.

A third characteristic of group environments is that they provide a variety of interactional settings which may be more or less congruent with those the child is familiar with from home. Another Harvard student, Helen Featherstone (in press) discovered some intriguing facts about the settings in which children choose to spend their time in the Main Street School. Here the kitchen is available as one setting for the children. Featherstone noticed that in 25 observations in the kitchen, certain children were there very often while others were rarely there. What was special about the kitchen? Not eating, as little tasting was done. She suggests that activity in the kitchen had several characteristics: it was the only place in the school that always had a stationary adult, and it had an activity structured in two ways -- by teacher direction, telling children what to do to help prepare

today's recipe, and a definite beginning, middle and end to the activity itself. In further observations, Mrs. Featherstone found that the children most often in the kitchen were also most often found in the one other school setting where an adult was sometimes stationary -- a room for art projects, and they were among the high half of the entire group on a measure of seeking the occasional stationary adult in settings other than these two.

Featherstone then looked at the distribution of children in three settings which contrasted with the kitchen on these characteristics -- the art table, block area and rug where table toys were used. There was not one child who scored high for any of these more self-directed settings and for the kitchen. Featherstone comments:

> Clearly different children are actively seeking different kinds of settings in a very consistent way. Furthermore the kinds of choices they make seem to be associated with ethnicity and economic class: of the eleven children scoring high for the kitchen all are either low-income or Black. For neither type of setting is there striking homogeneity along lines of age or sex.
>
> This could be taken to suggest that the school was poorly integrated -- that in one setting an observer would find only white middle-income children and in another only Black low-income children. That was not, in fact, the case. In all my observations of the school, I rarely saw groups of children which were homogeneous by race, economic class or age. Children worked and played constantly with children (and teachers) who were different from themselves. It was only when I observed particular settings over an extended period that I saw distinctive preferences in the use of that setting (in press).

In searching for interpretations of this data, one wishes immediately for transcriptions of those kitchen conversation. Unfortunately, the school year was over before the pattern of Featherstone's data became clear. Because Monaghan and Featherstone worked in the same school during the same year, we know a little about the children but not enough. We know that the children most often in the kitchen were distributed throughout Monaghan's ranking of frequency of interactions with teachers. Some of the children must have actively initiated conversations with teachers or been the recipients of adult initiatives, while others talked with peers or waited silently

for initiatives, from the teacher which rarely came. One possible advantage of the more didactic programs is that they guarantee the kind of settings which some children seem to seek for at least some time each day.

Because everything we know about language development suggests that it develops best -- in functions as well as structure -- when motivated by powerful communicative intent, and because we want to stimulate development and not just mimic it, it is important to try to make "natural," less didactic, group environments more effective. It should be possible to maximize consistency and thereby familiarity in child-adult relationships and guarantee that the children who need talking time with adults get it. Research by Tizard et al (in press) on the organizational structure of residential nurseries indicates some of the structural qualities of a good language environment: low child-adult ratio in the actual face-to-face group (six to one is more effective than twelve to two); staff stability versus staff turnover; and staff autonomy on the job. The existence of various interaction patterns and children's differential response to them is harder to understand and to use. We do not know how children's preference for interactional settings relates to their own mother's teaching styles (for instance as studied by Hess et al , 1968), and we don't know how to use these preferences for the development of communication skills.

References

Bellugi, U. The acquisition of the system of negation in children's speech. Cambridge, Mass.: M.I.T. Press, in press.

Bereiter, C. & Englemann, S. Teaching disadvantaged children in the preschool. Englewood Cliffs, New Jersey: Prentice-Hall, 1966.

Bernstein, B. A critique of the concept "compensatory education." In Cazden, C.B., Hymes, D. & John, V. (Eds.) Functions of language in the classroom. New York: Teachers College Press, in press.

Bissell, J.S. The cognitive effects of pre-school programs for disadvantaged children. In J.L. Frost (Ed.), Early childhood education rediscovered, second edition. New York: Holt, Rinehart and Winston, in press.

Bloom, L.M. Language development: form and function in emerging grammars. Cambridge: M.I.T. Press, 1970.

Brown, R. From codability to coding ability. In J. Bruner (Ed.), Learning about learning: a conference report. Washington, D.C.: U.S. Dept. of Health, Education and Welfare, 1966. Pp. 185-195.

Brown, R., Cazden, C.B., & Bellugi, U. The child's grammar from I to III. In J.P. Hill (Ed.), 1967 Minnesota symposium on child psychology. Minneapolis: University of Minnesota Press, 1969. Pp. 28-73.

Cazden, C.B. The situation: a neglected source of social class differences in language use. Journal of Social Issues, 1970, 26 (2), 35-60. Shorter version in F. Williams (Ed.), Language and poverty: perspectives on a theme. Chicago: Markham, 1970. Pp. 81-101.

Cazden, C.B. Language programs for young children: notes from England and Wales. In C.S. Lavatelli (Ed.), Language training in early childhood education. Urbana, Illinois: University of Illinois Press for the ERIC Clearinghouse on Early Childhood Education, 1971. Pp. 119-153.

Cazden, C.B. Child language and education. New York: Holt, Rinehart and Winston, in press.

Chomsky, C.S. The acquisition of syntax in children from 5 to 10. Cambridge, Mass.: M.I.T. Press, 1969.

Cole, M. & Bruner, J.S. Cultural differences and inferences about psychological processes. American Psychologist, 1971, 26, 867-876.

Elkonin, D.B. Development of speech. In A.V. Zaporozhets & D.B. Elkonin (Eds.), The psychology of preschool children. Cambridge, Mass.: M.I.T. Press, 1971. Pp. 111-185.

Ervin-Tripp, S. Social backgrounds and verbal skills. In R. Huxley & E. Ingram (Eds.), Language acquisition: models and methods. New York: Academic Press, 1971. Pp. 29-39.

Featherstone, H. The use of settings in a heterogeneous pre-school. Young Children, in press.

Flavell, J.H. et al, The development of role-taking and communication skills in children. New York: Wiley, 1968.

Cleason, J.B. An experimental approach to improving children's communicative ability. Cambridge, Mass.: unpublished manuscript, 1971.

Heider, E.R. Style and accuracy of verbal communications within and between social classes. Journal of Personality and Social Psychology, 1971, 18, 33-47.

Hess, R.D., Shipman, V.C. Brophy, J.E., & Bear, R.M. The cognitive environments of urban preschool children. Chicago: The University of Chicago Graduate School of Education, 1968.

Horner, V.N. The verbal world of the lower-class three-year-old: a pilot study in linguistic ecology. Unpublished doctoral dissertation, University of Rochester, 1968.

Hymes, D. Introduction. In C.B. Cazden, V.P. John & D. Hymes (Eds.), Functions of language in the classroom. New York: Teachers College Press, in press.

John, V.P. A study of language change in integrated and homogeneous classrooms. Progress Report No. 2, February 15, 1968.

Klima, E.S. & Bellugi, U. Syntactic regularities in the speech of children. In J. Lyons & R.J. Wales (Eds.), Psycholinguistics papers. Edinburgh: University Press, 1966. Pp. 183-208.

Kohlberg, L. & Mayer, R.S. Early education: a cognitive-developmental view; II: The developmental-philosophic strategy for defining educational aims. Cambridge, Mass.: Harvard Graduate School of Education, unpublished manuscript, 1972.

Kramer, P., Koff, E. & Luria, Z. The development of competence in an exceptional structure of English in children and young adults ages 8-20. Child Development, in press.

Krauss, R.M. & Gluksberg, S. The development of communication: competence as a function of age. Child Development, 1969, 40, 255-266.

Krauss, R.M. & Rotter, G.S. Communication abilities of children as a function of status and age. Merrill-Palmer Quarterly, 1968, 14, 161-173.

Luria, A.R. & Yudovich, F. Speech and the development of mental processes in the child. Reprinted by Penguin Books, 1971.

Miller, G.A., Galanter, E., & Pribram, K.H. Plans and the structure of behavior. New York: Holt, Rinehart and Winston, 1960.

Monaghan, A.C. Children's contacts: some preliminary findings. Unpublished term paper, Harvard Graduate School of Education, 1971.

Moore, D. A comparison of two methods of teaching specific language skills to lower-class pre-school children. Unpublished doctoral dissertation, Harvard University, 1971.

Phillips, J.R. Formal characteristics of speech which mothers address to their young children. Unpublished doctoral dissertation, The Johns Hopkins University, 1970.

Piaget, J. The language and thought of the child. Originally published 1926. Cleveland, Ohio: World, 1955.

Polanyi, M. Personal knowledge: towards a post-critical philosophy. New York: Harper Torchbooks, 1964.

Ryle, G. The concept of mind. New York: Barnes & Noble, 1949.

Scheffler, I. Conditions of knowledge. Chicago: Scott, Foresman, 1965.

Schrager, T. "Aint" didn't never hurt no one. Unpublished research paper, Harvard Graduate School of Education, 1971.

Slobin, D.I. Questions of language development in cross-cultural perspective. Paper prepared for symposium on "Language learning in cross-cultural perspective," Michigan State University, September, 1968.

Smothergill, N.L., Olson, F. & Moore, S.G. The effects of manipulation of teacher communication style in the preschool. Child Development, 1971, 42, 1229-1239.

Snow, C.E. Language acquisition and mothers' speech to children. Child Development, in press.

Talbert, C.S. Interaction and adaptation in a Negro Kindergarten. St. Louis: Washington University Department of Anthropology. Paper presented at meeting of the American Anthropological Association, Seattle, November, 1968.

Tizard, B., Cooperman, O., Joseph, A. & Tizard, J. Environmental effects on language development: a study of young children in long-stay residential nurseries. Child Development, in press.

Weir, H. Language in the crib. The Hague: Mouton, 1962.

White, B. An analysis of excellent early educational practices: preliminary report. Interchange (Toronto: Ontario Institute for Studies in Education), 1971, 2 (2), 71-88.